

Claims:

1. A compound of the general structure (I)



in which

R is independantly hydrogen or a group of the formula $\text{M}'\text{R}^1\text{R}^2\text{R}^3$,

R' is a group of the formula $\text{M}'\text{R}^4\text{R}^5\text{R}^6$,

R'' is hydrogen, a C_1 to C_{12} alkyl, a C_6 to C_{14} aryl or a C_7 to C_{20} alkylaryl,

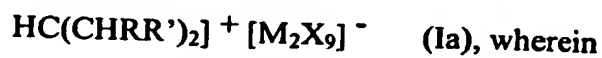
M is Zr or Hf,

M' is Si, Ge, Sn or Pb,

X is a halogen atom, and R^1 to R^6 is a C_1 to C_{12} alkyl group, a C_6 to C_{14} aryl or a C_7 to C_{20} alkylaryl.

2. A compound according to claim 1 wherein M' is Si or Sn.

3. A compound according to claim 1 with the general structure (Ia)



R is a group of the formula $\text{SiR}^1\text{R}^2\text{R}^3$,

R' is a group of the formula $\text{M}'\text{R}^4\text{R}^5\text{R}^6$,

R'' is hydrogen, a C_1 to C_{12} alkyl, a C_6 to C_{14} aryl or a C_7 to C_{20} alkylaryl,

M is Zr or Hf,

M' is Si, Ge, Sn or Pb,

X is a halogen atom, and

R^1 to R^6 is a C_1 to C_{12} alkyl group, a C_6 to C_{14} aryl or a C_7 to C_{20} alkylaryl.

4. A compound according to claim 1 with the general structure (Ib)

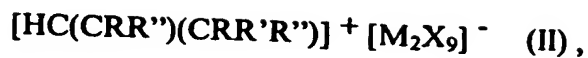


R, R', and M denote for the groups stated in claim 1 and R^1 to R^6 denote for methyl.

5. A catalyst of the general structure (I) according to any of claim 1 to 4.

6. A catalytic composition comprising a compound of the general structure (I) to any of claim 1 to 4.
- 5 7. A process for homo- or co-polymerizing isoolefines, optionally in the presence of further copolymerizable monomers, in the presence of a compound of the general structure (I) according to any of claim 1 to 4.
8. A process according to claim 7 wherein isobutene is polymerized.
- 10 9. A process according to claim 7 wherein isobutene and isoprene are polymerized.
10. A process according to claim 8 or 9 wherein the monomer/monomers are polymerized in the presence of one or more co-polymerizable monomers.
- 15 11. A metalorganic compound comprising a non-coordinating anion of the general structure $[M_2X_9]^-$ in which M is Zr or Hf and X is a halogen atom.
12. A method of homo- or copolymerizing an olefin in the presence of a compound comprising an anion of the general structure $[M_2X_9]^-$ in which M is Zr or Hf and X is a halogen atom.
- 20 13. A compound comprising a cation of the general structure (III)

$$[HC(CRR'R'')(CRR'R'')]^+ \quad (III),$$
in which R is independantly hydrogen or a group of the formula $M'R^1R^2R^3$,
R' is a group of the formula $M'R^4R^5R^6$,
R'' is hydrogen, a C_1 to C_{12} alkyl, a C_6 to C_{14} aryl or a C_7 to C_{20} alkylaryl,
M' is Si, Ge, Sn or Pb, and
R¹ to R⁶ is a C_1 to C_{12} alkyl group, a C_6 to C_{14} aryl or a C_7 to C_{20} alkylaryl.
- 30 14. A method of of stabilizing a compound of the general structure (II)



in which

R is a group of the formula $\text{M}'\text{R}^1\text{R}^2\text{R}^3$,

R'' is hydrogen, a C_1 to C_{12} alkyl, a C_6 to C_{14} aryl or a C_7 to C_{20} alkylaryl,

M is Zr or Hf,

M' is Si, Ge, Sn or Pb

X is a halogen atom, and

R^1 to R^3 is a C_1 to C_{12} alkyl group,

with a compound R' of the formula $\text{M}'\text{R}^4\text{R}^5\text{R}^6$, in which M' is Si, Ge, Sn or Pb and

R^4 to R^6 is a C_1 to C_{12} alkyl group.